UNIVERSITY OF GONDAR

COLLEGE OF MEDICINE AND HEALTH SCIENCES

INSTITUTE OF PUBLIC HEALTH

Blood Pressure Control and its associated factors among hypertensive patients attending in Debre Tabor Hospital, South Gondar Zone, Amhara National Regional State, Northwest Ethiopia.

By: Destaw Fetene (BSc)

Advisors:

Mr. Amsalu Feleke (MPH, Associate Professor)

Dr. Berihun Megabiaw (MD, MPH, PhD Candidate, Associate Professor)

A THESIS SUBMITTED TO THE INSTITUTE OF PUBLIC HEALTH, COLLEGE OF MEDICINE AND HEALTH SCIENCES, UNIVERSITY OF GONDAR IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH IN EPIDEMIOLOGY AND BIOSTATISTICS.

May, 2015

Gondar, Ethiopia

UNIVERSITY OF GONDAR

COLLEGE OF MEDICINE AND HEALTH SCIENCES

INSTITUTE OF PUBLIC HEALTH

Blood Pressure Control and its associated factors among hypertensive patients attending in Debre Tabor Hospital, South Gondar Zone, Amhara National Regional State, Northwest Ethiopia, 2015

By: Destaw Fetene (BSc)

Mobile: +251918037193

E-mail: destaw.fetene@gmail.com

Approved by the Examining Board

_____ _____

Head, Institute of Public Health

Advisors:

1. Mr. Amsalu Feleke (MPH, Associate Professor) _____
2. Dr.Berihun Megabiaw (MD, MPH, PhD Candidate, Associate Professor)_____

Examiner

_____ _____

_____ _____

Acknowledgement

I would like to express my heartfelt gratitude to my advisors, Mr. Amsalu Feleke and Dr. Berihun Megabiaw who have been a great help to the preparation of this research.

Also I would like to express my great thank to the University of Gondar, Institute of Public Health for giving me the chance to conduct this research.

My acknowledgement extends to study participant for their time and willingness to respond; to data collectors, and the supervisor for their friendly work.

Finally, my deep thankfulness goes to my beloved wife Sr. Mekides Abate, in which such a success might be untouchable without her endless support.

Acronyms

ANRS	Amhara National Regional State
ANRSHB	Amhara National Regional State Health Bureau
BP	Blood Pressure
BSc	Bachelor of Science
CKD	Chronic Kidney Disease
CVD	Cardio Vascular Disease
DBP	Diastolic Blood Pressure
DM	Diabetes Mellitus
DTH	Debre Tabor Hospital
EPI INFO	Epidemiological Information
ERB	Ethical Review Board
ETB	Ethiopian Birr
FMOH	Federal Ministry of Health
Hg	Mercury
HTN	Hypertension
IHD	Ischemic Heart Disease
Kg	Kilogram
mmHg	Millimeter of Mercury
MPH	Master of Public Health
MSc	Master of Sciences
OPD	Outpatient Department
PI	Principal Investigator
SBP	Systolic Blood Pressure
SGZ	South Gondar Zone
UoG	University of Gondar

Table of contents

Contents **Pages**

List of Tables **Pages**

List of Figures **Pages**

Abstract

Background: Hypertension is a global public health issue which contributes to 13 % of global deaths. It is also the most common modifiable cardiovascular risk factor worldwide. Controlling blood pressure is associated with reduction in cardiovascular risk and death, as well as health and economic gains. In Ethiopia, particularly in the study area studies on blood pressure control and its associated factors are scarce.

Objective: The aim of this study was to assess blood pressure control and identify factors associated with it at Debre Tabor Hospital, South Gondar Zone, ANRS, Northwest, Ethiopia, 2015.

Methods: A hospital based retrospective follow up study from November 10, 2014-May 10, 2015 were employed. All hypertensive patients who were on treatment and fulfilled the criteria during the study period were included in the study. A structured questionnaire which was adapted from WHO STEP wise approach was prepared to collect the data. Both primary and secondary data were taken. Controlled blood pressure was defined as average BP of <140/90 mmHg (< 150/ 90 mmHg for age ≥ 60 years) based on three blood pressure readings taken every other month from patients chart starting 6 months back from the study period.
Data was entered using EPI INFO version 7 and analyzed by using SPSS version 20. Frequencies, means, and standard deviations were used to describe the study population in relation to relevant variables. Bivariate and multivariable analyses were also carried out.

Results: A total of 392 respondents participated in the study with a response rate of 98.74 %. The overall prevalence of controlled hypertension was 42.9% (95% CI: 38.3, 47.4). The multivariable analysis showed that female (AOR=1.94, 95% CI: 1.15, 3.26), age group of 18-40 years (AOR= 0.34, 95% CI: 0.14, 0.85) and 41-60 years (AOR=0.48, 95% CI: 0.28, 0.83), vegetable consumption on most days of the week (AOR= 2.16, 95% CI: 1.25, 3.73), use of top added salt on a plate (AOR=0.20, 95% CI: 0.11, 0.36), adequate physical exercise (AOR=4.85, 95% CI: 2.39, 9.83), having asthma (AOR =0.33, 95% CI: 0.12, 0.88), number of drugs taken per day (AOR=0.33, 95% CI: 0.16, 0.67) and adherence to antihypertensive drugs (AOR= 5.59, 95%CI= 2.83, 11.07) were significantly associated with blood pressure control.

Conclusion and recommendation: Only 42.9% of hypertensive patients were controlled their blood pressure and it's significantly lower in men than women. Factors such as sex, age, vegetable consumption on most days of the week, use of top added salt on a plate, adequate physical exercise, having asthma, number of drugs taken per day and adherence to antihypertensive drugs were significantly associated with blood pressure control.
Recognizing the fact that controlling blood pressure reduces CVD morbidity and mortality and prevents costly interventions, it is recommended to policy makers to develop strategies and efforts in collaborate with stakeholders about the importance of lifestyle modifications, early diagnosis and management of co morbidities, and adherence counseling to improve the management of hypertension.

Key words: Antihypertensive, Cardio vascular disease, Retrospective follow up**,** Debre Tabor, Hypertension, Blood pressure control.

1. Introduction

1.1. Statement of the problem

Hypertension known as high blood pressure (a blood pressure greater or equal to 140/90 mm Hg) is a global public health issue (1, 2). Globally, nearly one billion people have hypertension, estimated to increase to 1.56 billion adults by the year 2025 with two thirds in developing countries (3, 4). The prevalence of hypertension is highest in the African region including Ethiopia at 46% of adults aged 25 and above (5).

Prolonged and uncontrolled elevation of blood pressure eventually damages blood vessels throughout the body, particularly in target organs such as the heart, kidneys, brain, and eyes (6) and the usual consequences are myocardial infarction, heart failure, renal failure, strokes, and impaired vision (3, 5-7).

Hypertension is currently the second most important preventable risk factor for premature death (5) and contributes to 13 % of the global deaths (5, 8, 9). Of 17 million deaths due to CVD worldwide, complication of hypertension accounts for 9.4 million deaths every year. It is also responsible for at least 45% of deaths due to heart disease, and 51% of deaths due to stroke (5, 8, 9). In Ethiopia 3.5% of all deaths is due to HTN and making it the 7th leading cause of death (10).

Hypertension is a modifiable risk factor for cardiovascular disease (CVD) morbidity and mortality (11). Blood pressure reductions as small as 2 mmHg reduce the risk of CVD events by up to 10% (3) and a 20 mmHg lower systolic blood pressure is associated with less than half the risk of dying from a stroke, and half the risk of dying from coronary heart disease (2).

There are also significant health and economic gains attached to good control of blood pressure. Treating complications of hypertension leads to costly interventions such as cardiac bypass surgery, carotid artery surgery and dialysis, draining individual and government budgets (8, 12).

A Meta analysis study conducted in many countries revealed that less than 25% of patients treated for hypertension had good control of blood pressure (9). In sub-Saharan Africa, overall 18% of individuals with hypertension were receiving treatment across the studies, and only 7% had controlled blood pressure (13).

Factors that affect blood pressure control include non modified (age, gender, ethnicity and family history of hypertension (14) and modified factors (salt intake, alcohol consumption, vegetables and fruits consumption, fat and other types of diet, weight, regular physical exercise and relaxation therapy (2).

Studies on blood pressure control and its associated factors in developing countries including Ethiopia are scarce and largely based on secondary data and the main modifiable risk factors are not well addressed. Moreover, some factors are contradictory in predicting blood pressure control. Therefore, this study is designed to fill this gap by investigating both modifiable and non modifiable risk factors of blood pressure control in the study area based on both primary and secondary data.

.

1.2. Literature review

1.2.1. Magnitude of controlled blood pressure

Many studies documented that hypertension is uncontrolled among patients taking antihypertensive drugs. A study conducted in rural and urban communities in high, middle, and low income countries showed only 32.5% of those receiving hypertension treatment were controlled their BP (15). A community-based study conducted in Kerala, India on the prevalence, awareness, treatment and control of hypertension in an elderly, only 25% of those treated for hypertensive achieved adequate control of blood pressure (16).

A study conducted on the prevalence, awareness, and control of HTN among Asian Indians living in urban Singapore and rural India showed that the blood pressure control in the two populations were 48.7% and 46.9% respectively (8). In another study conducted in urban-rural China showed that only 45.9% of treated hypertensive patients had blood pressure under control (17). One more study conducted in Macau, China among those individuals who received treatment, 49% achieved blood pressure control (18).

A study conducted in Vietnam showed that 36.3% of hypertensive's that were being treated successfully controlled their BP (19). In another population based survey conducted in Bangladesh among patients received antihypertensive drugs only 31.4% had controlled their HTN (20).

The low rates of controlled blood pressure in Africa are a major public health concern as the population in this region is growing(11). A community based cross sectional study in self selected Sub-Saharan African urban population among those treated, 24.6% was at target BP levels/controlled (21).

A study on awareness of HTN and factors associated with uncontrolled HTN in Sudanese adults of those hypertensive patients on treatment, 64% had their BP controlled (22). Study in Ethiopia at Adama Hospital Medical College among ambulatory hypertensive patients treated for HTN revealed that the overall control rate was 43.6% (14).

1.2.2. Factors associated with controlled blood pressure

1.2.2.1.Socio economic and demographic factors

Socio economic and demographic determinants of health have an adverse impact on behavioral risk factors and in this way influence the control of blood pressure. Different studies documented that sex has a significant effect on blood pressure control. Study conducted in rural and urban communities in high, middle, and low income countries (15), Bangladesh (20), self selected sub-Saharan African urban population (21), Nsukka, a city located in South- Eastern Nigeria (23), and Sudanese adults (22) showed that females were significantly control their BP than males. Where as a study conducted in Chennai urban rural epidemiology revealed that blood pressure control were more common among men than women (17).

Different studies revealed that among hypertensive patients taking antihypertensive drugs, age has significantly associated with blood pressure control. Study conducted in rural and urban communities in high, middle, and low income countries (15), Macau, China (18) showed that among those individuals who received treatment older age were more likely to have their blood pressure controlled. While a study conducted in Southern China showed that elderly patients were associated with uncontrolled hypertension (24).

Study in Macau, China showed that married hypertensive patients were significantly associated with good blood pressure control (18). A study conducted in Bangladesh among patients on antihypertensive drugs revealed that rich households were more likely to control their BP as compared to the poor households (20).

Studies in different countries among hypertensive patients taking antihypertensive drugs showed that educational status has significantly associated with blood pressure control. Study conducted in high, middle, and low income countries (15), Bangladesh (20), and Southern China (24), showed that higher education level were significantly associated with controlled blood pressure. Whereas study conducted in Sudanese adults, controlled BP were significantly higher in people with lower education, as compared with higher education (22).

Different studies documented that residence is significantly associated with blood pressure control in patients taking antihypertensive drugs. Study conducted in Southern China showed that living in rural and suburban areas were associated with uncontrolled hypertension (24). Whereas study conducted in Ethiopia at Adama Hospital Medical College showed that rural participants significantly controlled their BP than urban (14).

1.2.2.2.Life style factors

Blood pressure control is mainly associated with and causally linked with five particular behaviors namely tobacco use, excessive use of alcohol, physical inactivity, unhealthy diet (high salt intake and, insufficient fruit and vegetable consumption) and obesity (11).

A community-based, cross-sectional survey in Southern China (24) and a study conducted in Sudanese adults (22) among hypertensive patients taking antihypertensive drugs showed that smokers were significantly associated with uncontrolled blood pressure. Study conducted in Southern China on associated factors of uncontrolled hypertension among elderly hypertensive patients revealed that alcohol use were associated with uncontrolled hypertension (24).

Adequate physical activity has many health-promoting effects and has a direct, independent role in reducing blood pressure (11). Studies conducted in Southern China (24), and self selected sub-Saharan African urban population among those treated revealed that adequate physical activity were associated with controlled blood pressure (21).

Restriction of sodium intake to 2 g per day lowers systolic BP and diastolic pressure on average by 3.7 to 4.8 mm Hg and 0.9 to 2.5 mm Hg respectively (25). Studies conducted in Macau, China (18) and Southern China (24) among hypertension patients taking antihypertensive drugs, excessive salt consumption were less likely to controlled their blood pressure.

1.2.2.3.Co-morbidities

Different studies acknowledged that co morbidities are significantly associated with blood pressure control. A study conducted at academic family medicine clinic in Edmonton, Alta illustrate that among hypertensive patients who take antihypertensive drugs, those with diabetes appeared less likely to have controlled hypertension (26). Whereas a study conducted in KwaZulu-Natal, South Africa (27) and Adama referral hospital in Ethiopia (14) revealed that self-reported diabetes has significantly associated with good BP control. Study conducted in KwaZulu-Natal, South Africa showed that self-reported asthma was significantly associated with poor BP control (27).

1.2.2.4. Medication related

Early initiation of antihypertensive drug therapy significantly reduces blood pressure (28). A study conducted in Southern China (24) revealed that most treated hypertensive patients used combination therapy of antihypertensive medications, and those used long-acting antihypertensive medications had a higher rate of adequately controlled hypertension.

Good adherence to anti hypertensive treatment is an important part of blood pressure control. Different studies documented that patient medication adherence have significantly associated with blood pressure control. According to studies conducted among hypertensive patients of primary health clinics in Malaysia (29), KwaZulu-Natal, South Africa (27), and University of Gondar Hospital, Northwest Ethiopia (30) blood pressure control rates were found to be better among adherers to antihypertensive drugs than nonadherers.

Different studies documented that number of medications have significant association with blood pressure control. For instance study in KwaZulu-Natal, South Africa showed being prescribed more than one antihypertensive medication was associated with poor BP control (27). A study done in Ethiopia Adama referral hospital also found that participants who had taken less than 3 drugs had good BP control than who took greater than 3 drugs (14).

The overall studies revealed that among hypertensive patients who received antihypertensive drugs, controlled blood pressure were relatively low. Factors such as age, gender, education, marital status, economic status, residence, number of medications per day, type of medications co-morbid medical conditions, physical exercise, salt intake, smoking and alcohol intake have all been shown to affect blood pressure control in various populations.

Conceptual frame work

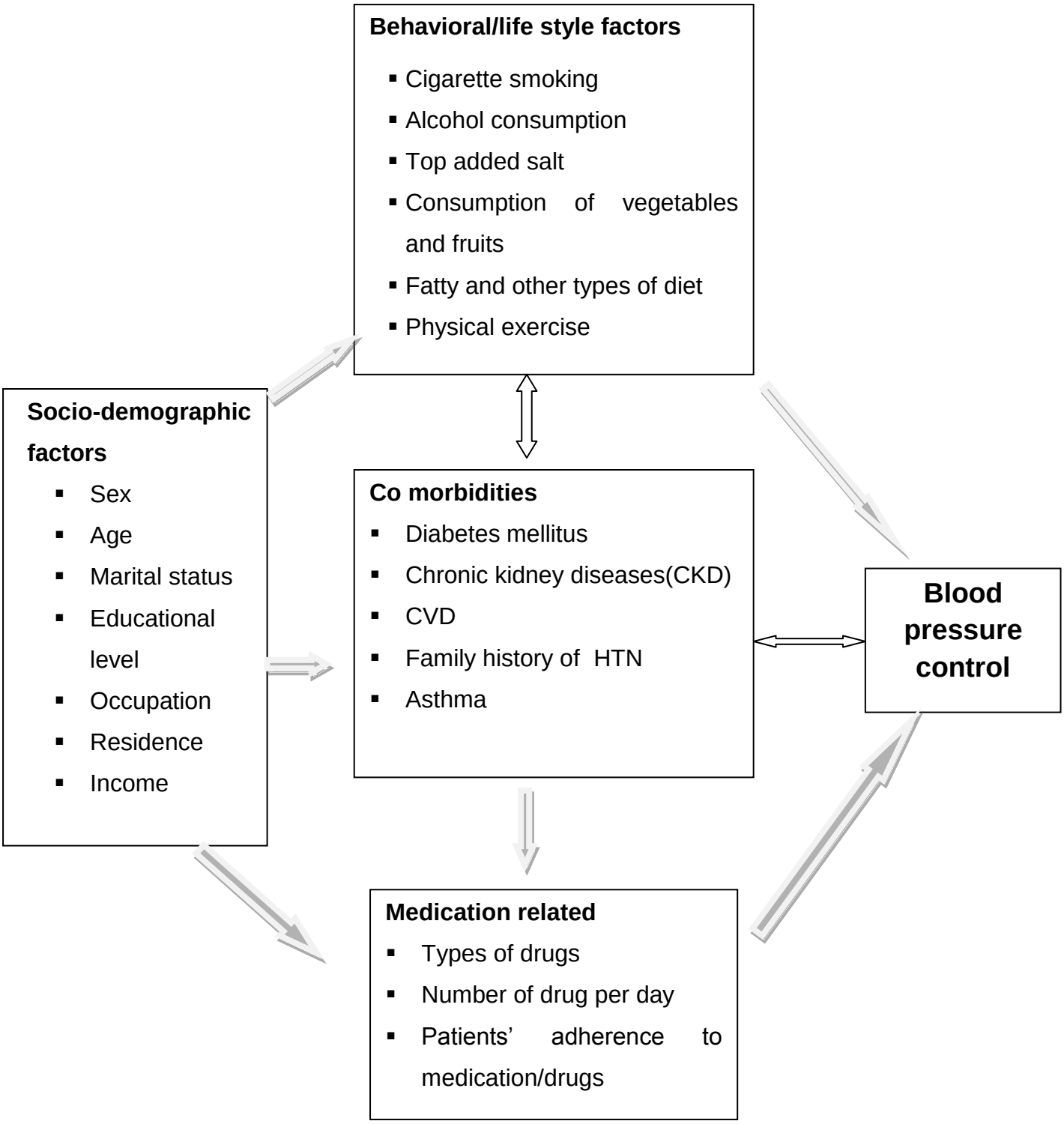

Fig 1: Conceptual frame work of blood pressure control and its associated factors

1.3. Justification of the study

Hypertension is an established modifiable risk factor for cardio vascular diseases and deaths in Ethiopia. Long-term BP lowering to what is considered either normal or optimal levels results in several significant and important health benefits. There are also significant economic gains attached to adequate treatment and good control of blood pressure.

Yet, controlling blood pressure effectively decreases risk of cardio vascular diseases and deaths, magnitude of controlled blood pressure and its associated factors are scarce in an Ethiopian set-up particularly in the study area.

Hence, this study aims to investigate what proportion of patients who had been prescribed anti-hypertensive medication/s had adequately controlled their blood pressure, and to identify factors associated with it. The result of the study will help policy makers, responsible persons in the health institution, stakeholders and significant others to take actions.

2. Objectives

2.1. General objective

- To assess blood pressure control and its associated factors among hypertensive patients attending at Debre Tabor Hospital (DTH), South Gondar Zone, Amhara National Regional State, Northwest Ethiopia.

2.2. Specific objectives

- To determine blood pressure control of hypertensive patients attending at Debre Tabor hospital.
- To identify factors associated with blood pressure control of hypertensive patients attending at Debre Tabor hospital.

3. Methods

3.1. Study design and period

A hospital based retrospective follow up study from November 2014-May 2015 was employed. The study period was from March 23, 2015- May 10, 2015

3.2. Study area

The study was conducted at Debre Tabor hospital which is located in Northwest Ethiopia, Amhara National Regional State (ANRS), South Gondar Zone (SGZ), Debre Tabor town. Debre Tabor town is found 665 km from Addis Ababa and 100 km from Bahirdar on Bahirdar-Woldia main road. It was established in 1931G.C by Italian Missionaries. Currently the hospital has a catchment population of about 2.3 million and serving as a General Hospital for all population in the zone and nearby woredas. It has capacity of 91 beds for inpatient service with five disciplines (Surgery, Internal medicine, Pediatrics, Gynecology/Obstetrics and Neonatology) and 12 outpatient departments ($OPD_{S)}$.

Hypertension clinic is one of those clinics which give service for patients with hypertension disorder. The clinic currently gives service for about 7-40 hypertensive patients per day at OPD during working hours. The hospital has about 278 workers of which 175 were health professionals and the remaining are administrative workers. The hospital is now working in collaboration with Debre Tabor University.

3.3. Source and study population

3.3.1. Source population

The source population was all hypertensive patients who were diagnosed as hypertension and were taking anti-hypertensive treatment at Debre Tabor Hospital in Debre Tabor Town of South Gondar Administrative Zone.

3.3.2. Study population

The study population was hypertensive patients who were on anti-hypertensive treatment for at least 5 months before the study period and who were on follow-ups from March 23, 2015-May 10, 2015.

3.4. Inclusion and exclusion criteria

3.4.1. Inclusion criteria

All hypertensive patients age ≥18 years who were taking antihypertensive drugs in the hospital during the study period was included.

3.4.2. Exclusion criteria

Women with gestational hypertension during data collection period were excluded from the study.

3.5. Variables

3.5.1. Dependent variable

- Blood pressure control (controlled or uncontrolled)

3.5.2. Independent variables

- Socio-demographic
  - Sex, age, ethnicity, religion, marital status, educational level, occupation, residence, Income
- Behavioral factors
  - Cigarette smoking
  - Alcohol drinking
  - Top added salt
  - Consumption of vegetables and fruits
  - Fatty and other types of diet
  - Physical exercise
- Co morbidities
  - Family history of HTN, CVD, CKD, Asthma, Diabetes mellitus
- Medication related
  - Type of drugs
  - Number of drugs
  - Patients' adherence to drug/medications

3.6. Operational definitions

Controlled blood pressure: The achievement of an average blood pressure below 140/90 mmHg (<150/90 mmHg for age ≥60 years) in individuals being treated for HTN (3).

Gestational hypertension: is the development of new hypertension in a pregnant woman after 20 weeks gestation without presence of protein in the urine or other signs of preeclampsia.

Adherence to antihypertensive medications. The Morisky 4-Item self-report measures of medication-taking behavior were used for labeling patients as adherent or non-adherent. The total mean score ranges from 0 to 4.

- Adherent: if Morisky Medication Adherence Scale (MMAS) mean score of ≥3
- Non adherent**:** if MMAS mean score of <3

Numbers of medications/drugs were defined as all types of oral medication, including antihypertensive and non antihypertensive medications, taken on a regular basis and prescribed by healthcare providers.

Patient's physical activity is defined as

- Moderate level of physical activity: 3 or more days of vigorous intensity activity of at least 20 minutes per day or, 5 or more days of moderate intensity activity or, walking of at least 30 minutes per day.
- Low physical activity: less than 5 times 30 minutes of moderate activity per week, or less than three times 20 minutes of vigorous activity per week.
- Lack (No) of physical activities**:** not performing any form of moderate or vigorous activity for at least 10 minutes.

Alcohol consumption was defined as follows:

- Alcohol consumer: A hypertensive patient who drinks one glass of alcohol for at least one day/week.
- Not alcohol consumer: A person who did not drink any alcohol.

Top added salt on plate is defined as the additional salt on meal after food is prepared.

Current smokers are defined as participants who smoked at least one cigarette per day at the time of the study.

3.7. Sample size & sampling procedures

3.7.1. Sample size determination

The sample size was calculated by using single population proportion formula.

$$n = \frac{(Z_{\alpha/2})^2 p(1-p)}{d^2}$$

$$n = \frac{(1.96)^2 0.436(1-0.436)}{(0.05)^2} = 378$$

Where

n=Estimated sample size

P= Single population proportion (43.6%) =>Proportion of hypertensive patient who controlled their blood pressure (14).

$\mathbf{Z_{\alpha/2}}$ = value of standard normal distribution (Z-statistic) at the 95% confidence level (α= 0.05) which is 1. 96,

d= Margin of error 5% (0.05).

Sampling for some independent variables (24) using EPIDEMIOLOGICAL INFORMATION (EPIINFO) stat calculation**.**

Variable name	**Blood pressure control (P)**	**OR**	**n**
Smoker	38.2	2.8	174
Drinker	39.4	2	334
Overweight	37.4	2.3	252

3.7.2. Sampling procedures

There were a total of 421 hypertensive patients who were on follow up in the hospital. Since the required sample size was close to the target population all those hypertensive patients who met the criteria were included in the study.

3.8. Data collection instrument and procedures

A structured questionnaire which is adapted from WHO STEP wise approach to surveillance non communicable diseases(31), was prepared to collect the data. It was designed try to find data be relevant to socio-demographic characteristics (such as age, sex, marital status, occupational status, educational level, residence and family monthly income), medication related factors, behavioral/life style factors, co morbidities and measurements.

To ascertain blood pressure control, three blood pressure readings were taken every other month from patients chart starting 6 months back from the study period, and were averaged including the current.

Along with, primary data was obtained from each hypertensive patient by interviewing them during their follow up time.

3.9. Data quality control

To assure the data quality, questionnaire was first prepared in English and translated in to Amharic and then back to English by language scholars. The questionnaire was pre-tested through a random selection of 20 hypertensive patients from Woreta health center to assess whether the questionnaire items were easily understood by study participants and the interviewer. Careful modification of the data collection tool was done, before the main study was began.

Four data collectors and one supervisor were employed for data collection. Training was given for 2 days, regarding consent procedures, the research tool and how to collect data from participants and from charts.

Information exchange by telephone and close supervision by the principal investigator and supervisor were made on a daily basis in order to correct problems during the course of the data collection time, frequent checking of information collected for errors, missing values and its consistency in order to set right daily. Coding and data cleaning were done (checking frequencies and cross-tab for each item).

3.10. Data processing and analysis

Data were entered using EPI INFO version 7 and was checked and cleaned for completeness and consistency of values and variables. Data were exported from EPI INFO 7 to SPSS version 20 for further analysis, through checking missing values, computing calculable variables and recoding.

Descriptive statistics were done using statistical measurements. Frequency, percentages, means, standard deviations, finally tables and graphs were used to report findings. Bivariate analysis was done to check which variables have associations with blood pressure control. Variables found to have p-values up to 0.2 were fitted in multivariable logistic regression for controlling the possible effects of confounders. Finally the variables which have significant association with the outcome variable were identified on the basis of OR, 95% CI, p-values <0.05. Hosmer-Lemeshow goodness of test for the model was also checked.

4. Ethical considerations

Ethical clearance was obtained from Ethical Review Board (ERB) of Institute of Public Health, College of Medicine and Health Science, University of Gondar. Further approval was obtained from Debre Tabor Hospital Chief Executive, and finally written informed consent were held from each participant after delivering information regarding the purposes, the importance of the study and the variety of information needed, and assuring that confidentiality of data will be kept by using identification numbers rather than names and limiting access to the data. Participant involvement in the study was on a voluntary basis. The chances to ask anything about the study as well as freedom to refuse or stop the interview at any moment were given.

5. Dissemination and utilization of results

The results of the study will be presented to the University of Gondar, College of Medicine and Health Sciences, Institute of Public Health as part of Master of Public Health (MPH) thesis and it will be also getting share to Federal Ministry of Health (FMOH), ARSHB, South Gondar Zone Health office and Debre Tabor hospital administrations. Efforts will also be made to present the results on scientific conferences; and also the results will be disseminated through publication in local or international journals.

6. Results

A total of 392 respondents were involved in this study from 397 eligible hypertensive patients who were visiting hypertensive clinics for follow up (a response rate of 98.74%).

6.1 Socio-demographic characteristics of respondents

Among the total participants 211 (53.8 %) were females and the mean age of respondents was 58 years (SD±13 years) which range from 23-88 years. Three hundred eighty seven (98.7%) of the respondents were from Amhara ethnic group and 372 (94.9%) of them were Orthodox Christian by religion. From the total respondents 254 (64.8%) of them were married, 192 (49%) were unable to read and write and 272 (69.4%) were urban dwellers. The median monthly family income of the respondents was 600 ETB with inter quartile range of 1129 ETB (Table 1).

Table 1:-Sociodemographic characteristics of Hypertensive patients in Debre Tabor Hospital, South Gondar Zone, ANRS, Northwest Ethiopia, May 2015 (n=392)

Variable	Frequency	Percent
Sex		
Male	181	46.2
Female	211	53.8
Age in years		
18-40	41	10.5
41-60	179	45.7
≥61	172	43.9
Ethnic group		
Amhara	387	98.7
Other	5	1.3
Religion		
Orthodox	372	94.9
Muslim	11	2.8
Others*	9	2.3
Marital status		
Single	9	2.3
Married	254	64.8
Divorced	44	11.2
Widowed	80	20.4
Separated	5	1.3
Educational status		
Unable to read and write	192	49
Read and write	58	14.8
Primary school	53	13.5
Secondary school	15	3.8
High school	11	2.8
College/University completed	63	16.1
Occupational status		
Government employed	70	17.9
Farmer	97	24.7
Merchant	28	7.1
Daily laborer	10	2.6
Retired	22	5.6
Housewife	133	33.9
No job	25	6.4
Other**	7	1.8
Residence		
Urban	272	69.4
Rural	120	30.6
Monthly family income***		
≤ 370	98	25.0
371-600	103	26.3
601-1500	100	25.5
>1500	91	23.2

*Adventist **Student, Nongovernmental organization workers *** Income is categorized based on quartile classification.

6.2. Behavioral/life style characteristics of respondents

From all study participants, 384 (98%) and 112 (28.6%) of them were eating cereal products and vegetables on most days of the week respectively. Two hundred forty six (62.8%) of the respondents were using Sesame/Nug oil for their usual meal preparations and 126 (32.1%) of the respondents used additional salt when cooking or preparing food at home.

Among participants 5 (1.3%) of them were current smokers. Concerning alcohol consumption, 48 (12.2%) of them responded as they used alcohol currently and 30 (62.5%) of drinkers reported as they drank alcohol 1-3 days per week. Thirty (62.5%) of alcohol drinkers reported that as they drank 1 glass of alcoholic drink per dinking occasion. Regarding patients physical activity, 174 (44.4%) of the respondents are classified as having moderate levels of physical activity.

6.3. Co morbidities and Family history of hypertension related factors of the respondents

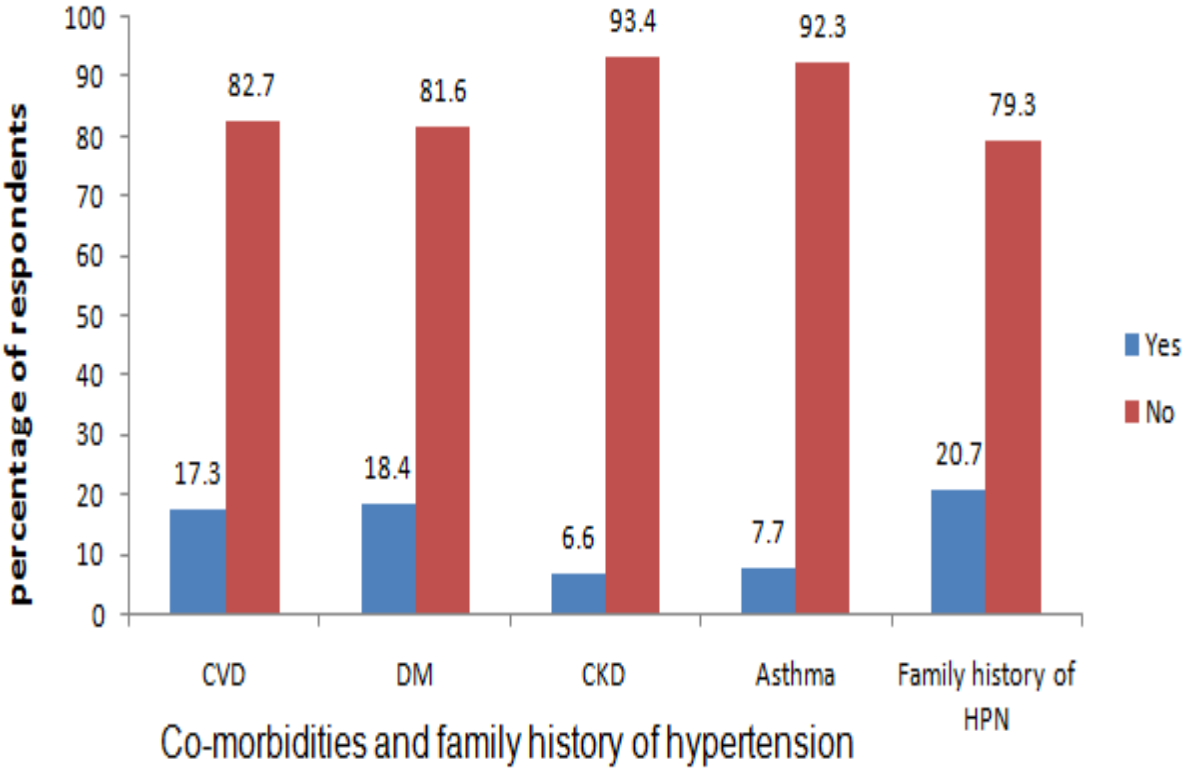

Figure 2: Co-morbidities and family history of hypertension of hypertensive patients in Debre Tabor Hospital, South Gondar Zone, North West Ethiopia, May 2015

6.4. Medication related characteristics of respondents

Among the respondents 285 (72.7%) of the study subjects had been taking less than 3 drugs per day and 303 (77.3%) of the subjects were adherent to their prescribed drugs (Table 2).

Table 2: Medication related characteristics of Hypertensive patients in Debre Tabor Hospital, South Gondar Zone, ANRS, Northwest Ethiopia, May 2015 (n=392)

Variable	Frequency	Percent
Types of drug		
HCT	115	29.3
Enalapril	45	11.5
Nifidipine	50	12.8
Atenelol	14	3.6
Methyldopa	3	0.8
HCT & Enalapril	79	20.2
HCT & Nifidipine	50	12.8
Enalapril & Nifidipine	25	6.4
HCT, Enalapril & Nifidipine	11	2.8
Number of drugs		
<3	285	72.7
>=3	107	27.3
Adherence level		
Adherent	303	77.3
Non adherent	89	22.7
Health education/advice about their disease		
Yes	343	87.5
No	49	12.5

6.5. Prevalence of blood pressure control

The mean systolic and diastolic blood pressure readings were 142.17 mmHg (±14.69 SD) and 87.74 mmHg (±8.69 SD). The overall prevalence of controlled blood pressure was 42.9% (95% CI: 38.3, 47.4).

6.6. Factors associated with blood pressure control

The multivariable analysis of logistic regression showed that sex, age, vegetable consumption on most days of the week, use of top added salt on a plate, level of physical exercise, having asthma, number of drugs taken per day and adherence to antihypertensive drugs were significantly associated with blood pressure control.

In this study, it was noted that females were two times (AOR=1.94, 95% CI: 1.15, 3.26) more likely to have control their blood pressure as compared to males. Hypertensive patients in the age group of 18-40 and 41-60 years were 66% times (AOR= 0.34, 95% CI: 0.14, 0.85) and 52% times (AOR=0.48, 95% CI: 0.28, 0.83) less likely to have controlled blood pressure respectively as compared to those older than 60 years.

Patients who consumed vegetables on most days of the week were two times (AOR=2.16, 95% CI: 1.25, 3.73) more likely to have controlled blood pressure as compared to patients who consumed vegetables for less than 4 days. Hypertensive patients who used top added salt on a plate was 80% times (AOR=0.20, 95% CI: 0.11, 0.36) less likely to control their blood pressure as compared to patients who didn't used top added salt.

Patients who did adequate and low level physical exercise were five times (AOR=4.85, 95% CI: 2.39, 9.83) and three times (AOR=2.61, 95% CI: 1.28, 5.31) more likely to control their blood pressure respectively as compared to patients with no physical activity.

Being asthmatic patients, the odds of controlled blood pressure were 67% times (AOR =0.33, 95% CI: 0.12, 0.88) lower than non asthmatic patients. Hypertensive patients who took 3 or more drugs per day were 67% times (AOR=0.33, 95% CI: 0.16, 0.67) less likely to have controlled blood pressure as compared to patients who took less than 3 drugs per day. The odds of controlled blood pressure among adherent clients to antihypertensive drugs were six times (AOR= 5.59, 95%CI= 2.83, 11.07) higher than the odds of controlled blood pressure among nonadherers to antihypertensive drugs (Table 3).

Table 3: Bivariate and multivariable analysis of factors associated with blood pressure control of Hypertensive patients in Debre Tabor Hospital, South Gondar Zone, ANRS, Northwest Ethiopia, May 2015 (n=392)

Variable	Blood pressure control		Crude OR (95% CI)	Adjusted OR (95 % CI)
	Controlled	Uncontrolled		
Sex				
Male	71 (39.2%)	110 (60.8%)	1	1
Female	97 (46.0%)	114 (54.0%)	1.32 (0.88, 1.97)	1.94 (1.15, 3.26)**
Age				
18-40	14 (34.1%)	27 (65.9%)	0.54 (0.27, 1.11)	0.34 (0.14, 0.85)**
41-60	70 (39.1%)	109 (60.9%)	0.67 (0.44, 1.02)	0.48 (0.28, 0.83)**
≥61	84 (48.8%)	88 (51.2%)	1	1
Vegetable consumption				
Yes	66 (58.9%)	46 (41.1%)	2.50 (1.60, 3.92)*	2.16 (1.25, 3.73)**
No	102 (36.4%)	178 (63.6%)	1	1
Top added salt				
Yes	22 (17.5)	104 (82.5%)	0.17 (0.10,0.29)*	0.20 (0.11, 0.36)**
No	146 (54.9%)	120 (45.1%)	1	1
Physical activity				
No physical exercise	21 (25.0%)	63 (75.0%)	1	1
Low level of physical activity	55 (41.0%)	79 (59.0%)	2.09 (1.14, 3.81)*	2.61 (1.28, 5.31)**
Adequate physical activity	92 (52.9)	82 (47.1%)	3.37 (1.89, 5.99)*	4.85 (2.39, 9.83)***
Cardiovascular diseases				
Yes	22 (32.4%)	46 (67.6%)	0.58 (0.34, 1.01)	0.86 (0.42, 1.78)
No	146 (45.0%)	178 (55.0%)	1	1
Diabetes mellitus				
Yes	16 (22.2%)	56 (77.8)	0.32 (0.17, 0.57)*	0.57 (0.26, 1.24)
No	152 (47.5%)	168 (52.5%)	1	1
Asthma				
Yes	7 (23.3%)	23 (76.7)	0.38 (0.16, 0.91)*	0.33 (0.12, 0.88)**
No	161 (44.5%)	201 (55.5%)	1	1
Number of drug taken per day				
<3	147 (51.6%)	138 (48.4%)	1	1
≥3	21 (19.6%)	86 (80.4%)	0.23 (0.14, 0.39)*	0.33 (0.16, 0.67)**
Adherence to medication				
Adherent	150 (49.5%)	153 (50.5%)	3.87 (2.20, 6.80)*	5.59(2.83, 11.07)***
Non adherent	18 (20.2%)	71 (79.8%)	1	1

*P-value<0.05 on Bivariate analysis **P-value<0.05 ***P-value<0.001

Hosmer and Lemeshow Test=0.664

7. Discussion

Controlling blood pressure in people with hypertension to reduce cardiovascular morbidity and mortality is a major challenge public health problem in many developing countries including Ethiopia.

This study revealed that only 42.9 % of hypertensive patients controlled their blood pressure. This finding was in line with studies done in Adama Hospital Medical College Ethiopia (43.6%) (14), urban-rural China (45.9%) (17), and rural India (46.9%) (8).

It was higher than studies done in rural and urban communities in high, middle, and low income countries (32.5%) (15), Kerala-India (25%) (16), Vietnam (36.3%) (19) and Bangladesh (31.4%) (20). However, it was lower than the studies done in Asian-Indians (48.7%) (15), Macau-China (49%) (18) and Sudanese adults (64%) (22).

This difference is probably due to the different living styles and dietary habits of the patients. Another possible explanation may be the difference in information, education and communication strategies; clinical as well as drug adherence level.

In this study, significant association between sex and blood pressure control was observed. Accordingly, female patients were two times more likely to control their BP as compared to males. This result is in line with studies done in rural and urban communities in high, middle, and low income countries (15), Bangladesh (20), self selected sub-Saharan African urban population (21), Nsukka, Nigeria (23), and Sudanese adults (22) where females were achieved better blood pressure control than males.

This may be due to males are usually consumes alcohol which reduces the effectiveness of antihypertensive drugs and leads hypertension to be uncontrolled. The other possible reason may be males are usually loaded by activities outside the door which make them tiring, exposes them to forget their drugs and finally make them difficult to control their BP. But this result is inconsistent from a study done in Chennai urban rural (17) where males were more likely to control their BP. This may be due to different study design.

Age was another factor significantly associated with BP control found in this study. Accordingly, hypertensive patients in the age group of 18-40 and 41-60 years were 66% and 52% less likely to control their BP respectively as compared to those older than 60 years. This finding is supported by study done in rural and urban communities in high, middle, and low income countries (15) and Macau, China (18). This may be due to denial of the existence of the disease or becoming busy with activities outside the home in young patients that makes them forget to take medications. This study is inconsistent with a study in Southern china (24) where elderly patients were less likely to control their BP. This may be due to difference in study population and sampling methods.

Eating foods high in vegetables reduces blood pressure of hypertensive patients. The finding of this study showed association between eating vegetables on most days of the week and BP control. Those hypertensive patients who ate vegetables on most days of the week were two times more likely to have controlled blood pressure as compared to patients who didn't ate vegetables on most days of the week. The possible reason may be vegetables are good source of potassium and this result in decreasing blood pressure.

Using top added salt on plate during meal preparation was significantly associated with BP control in this study. Hence, patients who used top added salt on a plate was 80% times less likely to control their BP as compared to patients who didn't used top added salt. This result is similar with studies done in Macau, China (18) and Southern China (24). This may be due to high salt intake causes fluid retention which increases cardiac burden resulting in high blood pressure.

Performing adequate physical activity have strong and independent role in reducing blood pressure. This study revealed patients who did adequate and low level of physical activity were five and three times more likely to control their blood pressure respectively than patients with no physical activity. It is in line with studies conducted in Southern China (24) and self selected sub-Saharan African urban population (21). The possible reason may be regular physical activity is a significant factor in weight reduction and blood pressure reduction.

Presence of asthma in patients with hypertension can worsen the conditions of the patient. This study revealed asthma was significantly and independently associated with blood pressure control. Asthmatic hypertensive patients were 67% times less likely to have controlled BP than non asthmatic hypertensive patients which is supported by a study in KwaZulu-Natal, South Africa (27). The possible explanation may be the effect of anti- asthmatic drugs which have a beta agonist effect on the heart (Increased rate and force of contraction) which results blood pressure to increase.

Number of drugs had a significant association with blood pressure control. This study revealed that patients who took three or more drugs a day was 67% times less likely to have controlled blood pressure as compared to patients who took less than three drugs. This study is in line with studies done in KwaZulu-Natal, South Africa (27), and Adama referral hospital in Ethiopia (14). The possible reason may be presence of co morbidities influence hypertensive patients to take more drugs for their diseases. As a result they may become less adherent to their drugs and finally their blood pressure becomes uncontrolled.

Adherence to prescribed medication was another factor significantly associated with blood pressure control in this study. Hypertension patients who were adherent to their prescribed antihypertensive drugs were six times more likely to control their blood pressure as compared to who were not adherent to their prescribed antihypertensive drugs. This study is in line with studies done in Malaysia (29), KwaZulu-Natal (27), and University of Gondar Hospital, Northwest Ethiopia (30). The possible reason may be as the number of drugs they took increases; they may confuse to take which drug at what time (may face a problem to take the right drug and dose at right time).

Limitations of the study

This study has the following limitations:

- ☞ This study is expected to be prone to a chicken egg dilemma which made it difficult to establish a cause-and-effect relationship between some associated factors and blood pressure control.
- ☞ Some key confounding variables including physical and biochemical measurements were not included in the study.
- ☞ Self-reporting was used as the only method of measuring adherence and may have the disadvantages of recall bias.

8. Conclusions and recommendations

Conclusions

The prevalence of controlled hypertension was relatively low in this study and it was significantly lower in men than women. Factors such as sex, age, vegetable consumption on most days of the week, use of top added salt, asthmatic patients, number of drugs they took and medication adherence were associated with blood pressure control.

Recommendations

Recognizing the fact that controlling blood pressure reduces CVD morbidity and mortality and prevents costly interventions, therefore we recommend the following:

For policy makers

- ☞ The need to develop strategies and efforts in collaborate with stakeholders to improve the management of hypertension, including the appropriate use of antihypertensive drugs, lifestyle modifications, early diagnosis and management of co morbidities.
- ☞ The need to give attention to male and for those ages less than 61 years.

Debre Tabor Hospital

- ☞ The need to advocate the importance of early diagnosis and treatment of co morbidities of hypertensive patients.
- ☞ The needs to advocate health workers in the hospital about the importance of adherence counseling, patient education about unnecessary additional salt intake, need of physical exercise and adequate vegetable servings on most days of the week which helps to improve blood pressure control of the patient.

For researchers

- ☞ We suggest researchers to do further longitudinal studies that include physical and biochemical measurements to identify most important variables associated with blood pressure control and to look at the cause and effect relationship between variables and blood pressure control.

9. References

1. Your Guide to Lowering Blood Pressure. National Heart, Lung, and Blood Institute. 2003.
2. Maryon-Davis A, Press V. easing the pressure: tackling hypertension. National Heart Forum 2005.
3. JNC-8 New Guidelines…Finally Let the controversies begin [database on the Internet]. Feb, 2014.
4. Hypertension & pre-hypertension in developing countries 2008.
5. Knott C, Mindell J. Hypertension:The health and social care information centre. HSE. 2011;1.
6. Brunner, Suddarth. Textbook of Medical-Surgical Nursing. 10th ed2010.
7. "The Impact of Non-Communicable Diseases (NCDs) and Neglected Tropical Diseases (NTDs) on Development in Africa": Status Report on Hypertension in Africa. Addis Ababa, Ethiopia: 22-26 April 2013 Contract No.: Sixth Ordinary Session.
8. Prevalence, awareness, and control of hypertension among Asian Indians living in urban Singapore and rural India. PubMed. 2013.
9. Okoro RN, Ngong CK. Assessment of patient's antihypertensive medication adherence level in non-comorbid hypertension in a tertiary hospital in Nigeria. Pharm Biomed Sci. 2012;3(2):47-54.
10. Health and Health Related Indicators.Addis Ababa, Ethiopia. Federal Ministry of Health, 2010.
11. Vijver Svd, Akinyi H, Oti S, et.al. Status report on hypertension in Africa - Consultative review for the 6th Session of the African Union Conference of Ministers of Health on NCD's. Pan African Medical Journal. 2013;16(38).
12. A global brief on Hypertension: Silent killer, global public health crisis. World Health Day. 2013.
13. Ataklte F, Erqou S, Kaptoge S, et.al. Burden of Undiagnosed Hypertension in Sub-Saharan Africa: A Systematic Review and Meta-Analysis. American Heart Association. November 10, 2014.
14. Lichisa GC, Tegegne GT, Gelaw BK, Defersha AD, Woldu MA, Linjesa JL. Blood pressure control and its contributing factor among ambulatory hypertensive patients in Adama Hospital medical college, East Shoa, Adama, Ethiopia. International Journal of Pharmaceutical and Biological Sciences Research and Development July 2014;2(7).
15. Chow CK, Teo KK, Rangarajan S, et.al. Prevalence, Awareness, Treatment, and Control of Hypertension in Rural and Urban Communities in High-, Middle-, and Low-Income Countries. JAMA. 2015;310(9):959-68.
16. Prevalence, awareness, treatment and control of hypertension in an elderly community-based sample in Kerala, India. Natl Medical Journal of India. 2000.
17. Mohan V, Deepa M, Farooq S, Datta M, Deepa R. Prevalence, Awareness and Control of Hypertension in Chennai - The Chennai Urban Rural Epidemiology Study. JAPI 2007;55

18. Ke L, Ho J, Feng J, et.al. Prevalence, Awareness, Treatment and Control of Hypertension in Macau: Results From a Cross-Sectional Epidemiological Study in Macau, China. American Journal of Hypertension. 2015; 28(2).
19. Son P, Quang N, Viet N, et.al. Prevalence, awareness, treatment and control of hypertension in Vietnam: results from a national survey. Journal of Human Hypertension. 2012;26:268–80.
20. Rahmana MM, Gilmoura S, Akterc S, Abea SK, Saitoa E, Shibuya K. Prevalence and control of hypertension in Bangladesh: amultilevel analysis of a nationwide population-based survey. Journal of Hypertension. 2015;33:465–72.
21. Dzudie A, Kengne AP, Muna WFT, et.al. Prevalence, awareness, treatment and control of hypertension in a self selected sub-Saharan African urban population: a cross-sectional study. BMJ. 2012.
22. BABIKER FA, ELKHALIFA LA, MOUKHYER ME. Awareness of hypertension and factors associated with uncontrolled hypertension in Sudanese adults. Cardiovascular Journal of Africa. July 2013;24(6):208–12.
23. Ekwunife OI, Udeogaranya PO, Nwatu IL. Prevalence, awareness, treatment and control of hypertension in a Nigerian population. March 2010;2(7):731-5
24. Yang L, Xu X, Yan J, et.al. Analysis on associated factors of uncontrolled hypertension among elderly hypertensive patients in Southern China: a community-based, cross-sectional survey. BMC Public Health. 2014;14(903).
25. August P. Initial Treatment of Hypertension. The new england journal of medicine. 2003;348:610-7.
26. Houlihan SJ, Simpson SH, Cave AJ, et.al. Hypertension treatment and control rates: Chart review in an academic family medicine clinic. Canadian Family Physician. 2009;55.
27. Duncana P, Howeab L, Manakusac Z, Purdya S. Determinants of blood pressure control in rural KwaZulu-Natal, South Africa. South African Family Practice. 2014;56(6):297–304.
28. Assessing and managing raised blood pressure in adults. Heart Foundation. 2010.
29. Ramli A, Ahmad NS, Paraidathathu T. Medication adherence among hypertensive patients of primary health clinics in Malaysia. 2012;6:613–22.
30. Ambaw AD, Alemie GA, W/Yohannes SM, Mengesha ZB. Adherence to antihypertensive treatment and associated factors among patients on follow up at University of Gondar Hospital, Northwest Ethiopia. BMC Public Health. 2012;12:282.
31. The WHO STEPwise approach to chronic disease risk factor surveillance (STEPS). Switzerland: World Health Organization.

10. Annexes

Annex A: Information sheet

Research title: Blood pressure control and its associated factors among hypertensive patients attending in Debre Tabor Hospital, South Gondar Zone, Amhara National Regional State, Northwest Ethiopia.

Introduction

This information sheet is prepared to explain the research project that you are asked to join by a group of research investigators. The research team includes a final year MPH graduate student, 4 data collectors from Debre Tabor Hospital and Debre Tabor Health Science College, one supervisor from Debre Tabor health Science College, and two advisors from UoG.

Name of Principal Investigator: Destaw Fetene (Bsc)

Name of Advisors:

1. Mr. Amsalu Feleke (MPH, Associate Professor)
2. Dr. Berihun Megabiaw (MD, MPH, PhD Candidate, Associate Professor**)**

Name of Organization: University of Gondar, College of Medicine and Health Sciences, Institute of Public Health

Name of the Sponsor: Self

Purpose of the research project:

The purpose of this research study is to determine blood pressure control and associated factors among hypertensive patient in Debre Tabor hospital, South Gondar Zone, Amhara National Regional State, Northwest Ethiopia, 2015.

Results from this study will be used to assist in making recommendations for those who are responsible to design effective and appropriate measure for the management of hypertension.

Procedure:

This study uses hospital based retrospective follow up study design, through using secondary data and well developed structured questionnaire. Permission will be processed first from the UoG, ANRHB and finally from DTH administration.

Risk and/or Discomfort:

There is no any risk or discomfort that you will face by participating in this research except devotion of time for responding the questioner. Every piece of information will be kept confidentially.

Benefits:

If you participate in this research project there may be some direct benefits like information about your BP status and how to control your blood pressure. There will be benefit for DTH hypertensive patients and further for the community.

Confidentiality:

All Personal identifiers & personal information will not be taken. Any personal information registered in the chart or what you are saying will not be transferred to other bodies. Every piece of information will be kept confidentially. Information will be accessed by the researcher only.

Right to refusal or withdraw

Your participation in this research study is voluntary. You may choose not to participate or you may withdraw your consent to participate at any time without losing any of your right.

Persons to contact:

This research project was reviewed and approved by the ethical committee of the University of Gondar. If you have any question you may contact the following individuals.

1. Destaw Fetene (Bsc)
   Phone number: +251918037193
   E-mail: destaw.fetene@gmail.com
2. Mr. Amsalu Feleke (MPH, Associate Professor)
   Phone number: +251918771312
   E-mail: felekeam@yahoo.com
3. Dr. Berihun Megabiaw (MD, MPH, PhD Candidate, Associate Professor)
   E-mail:beredomega@gmail.com

Annex B: Information sheet in Amharic

<u>የምርምሩ/የጥናቱ ርዕስ</u>:

በአማራ ክልላዊ መንግስት ጤና ጥበቃ ቢሮ በደብረታቦር ሆስፒታል ለደም ግፊት በሽታ የመድሃኒት ክትትል የሚያደርጉ ታካሚዎችን የህክምና ዉጤት እና ተዛማጅ ሁኔታዎችን የሚዳስስ ጥናት ::

<u>መግቢያ:</u>

ይህ አጠር ያለ ጽሁፍ የተዘጋጀው ስለ ምርምሩ መግለጫ ለመስጠትና የሰው ሀይል ስብጥሩን ገለጻ ለማድረግ ታስቦ ነው:: የጥናት ቡድኑ የመጨረሻ አመት ተማሪ የሆነዉን (ዋና ተመራማሪውን)፣ አራት የሰለጠኑ መረጃ ሰብሳቢ ባለሙያዎችን ከደብረታቦር ሆስፒታል እና ከደብረታቦር ጤና ሳይንስ ኮሌጅ ፤ አንድ ሱፐርቫይዘር ከደብረታቦር ጤና ሳይንስ ኮሌጅ እንዲሁም ሁለት አማካሪዎችን (ከጎንደር ዩኒቨርሲቲ) የያዘ ነው::

ዋና ተመራማሪ፡ ደስታዉ ፈጠነ

የአማካሪዎቹ ስም:

1. አቶ አምሳሉ ፈለቀ (ተባባሪ ፕሮፌሰር)
2. ዶር በሪሁን መጋቢያዉ (ተባባሪ ፕሮፌሰር)

የድርጅቱ ስም :የጎንደር ዩኒቨርሲቲ

ስፖንሰር፡ በግል

<u>የፕሮጀክቱ ዓላማ</u>

የዚህ ምርምር ዋና አላማ በአማራ ብሄራዊ ክልላዊ መንግስት ጤና ጥበቃ ቢሮ በደብረታቦር ሆስፒታል ለደም ግፊት በሽታ የመድሃኒት ክትትል የሚያደርጉ ታካሚዎችን የህክምና ዉጤት እና ተዛማጅ ሁኔታዎችን ማጥናት ነው::

<u>የአጠናን ዘዴ</u>

ለምርምሩ የሚውለው መረጃ የሚገኘው በቀጥታ ከተሳታፊዎቹ ጋር በሚደረግ ቃለ መጠይቅ ሲሆን በተጨማሪም የደም ግፊት ልኬታ፡የግፊት መድሀኒት እና ሌሎች ተዛማጅ በሽታዎችን ከታካሚዉ ካርድ የሚዎሰድ ይሆናል። የምርምር ፈቃድ በቅድሚያ በጎንደር ዩኒቨርሲቲ እውቅና ካገኘ በኋላ፤ ከጤና ጥባቃ ቢሮ አንዲሁም ከደብረታቦር ሆስፒታል ፈቃድ ሲያገኝ የሚከናወን ይሆናል::

ሊከሰቱ የሚችሉ ችግሮች

በዚህ ምርምር ውስጥ በመሳተፍዎ ጊዜዎትን ከማባከንዎ በቀር ምንም አይነት ሊያጋጥምዎ የሚችል ችግር አይኖርም፡፡ ይህንንም ለማረጋገጥ እያንዳንዱ የሚሠጡን መረጃ በሚስጥር የተጠበቀ መሆኑን አስቀድሜ ልገልፅልዎት እዎዳለሁ፡፡

ከምርምሩ ሊያገኙት የሚችሉ ጥቅሞች:

በዚህ ጥናት በመሳተፍዎ እርስዎ በቀጥታ ተጠቃሚ ከመሆንዎም (ለምሳሌ የደም ግፊት ሁኔታዎን፤እንዴት የደም ግፊትን መቆጣጠርን እንደሚችሉ) ባሻገር በጥናቱ ዉጤት በደብረታቦር ሆስፒታል ለሚታከሙ የደም ግፊት በሽተኞች እና ለማህበረሰቡ ወደፊት ጠቃሚ እንደሚሆን አያጠያይቅም፡፡ ስለዚህ በጥናቱ ቢሳተፉ ጠቀሜታዉ የጎላ ይሆናል።

ሚስጥራዊነቱ

እያንዳንዱ በምርምሩ ውስጥ የተካተቱት መረጃዎች በአግባቡ እና ሚስጥራዊነቱን እንደጠበቀ ስምዎትን ባልገለፀ መልኩ በተሰጠዎ ልዩ ቁጥር ይቀመጣል፡፡ይህም ከተመራማሪው በስተቀር ለማንም ግልፅ አይሆንም፡

በፍቃደኝነት ላይ የተመሰረተ ስለመሆኑና ተሳትፎን የማቋረጥ መብት

በዚህ ምርምር ውስጥ መሳተፍ በእርሶ ፈቃድ ላይ የተመረኮዘ ነው፡፡ነገር ግን በምርምሩ ውስጥ ያለመሳተፍ መብትዎ የተጠበቀ ነው፡፡እንዲሁም በምርምር ሂደት ላይ በማንኛውም ሰአት የማቋረጥ መብት አለዎት፡፡

ስለ ምርምሩ ጥያቄዎች ካለዎት

ይህ ምርምር በጎንደር ዩኒቨርሲቲ የስነምግባር ኮሚቴ የታየ እና ፈቃድ ያገኘ ነዉ። ተጨማሪ መረጃ ከፈለጉ ግን ከዚህ በታች ስማቸዉ እና አድራሻቻዉ በተዘረዘሩት ሰዎች ማግኘት ይችላሉ፡፡በመሆኑም ምርምሩን በተመለከተ ሆነ ሌሎች ጥያቄዎች ካለዎት

1. አቶ ደስታዉ ፈጠነ (ቢ ኤስ ሲ)

   ስልክ፡ 0918037193 ፤ ኢሜል destaw.fetene@gmail.com
2. አቶ አምሳሉ ፈለቀ (ኤም ፒ ኤች፤ተባባሪ ፕሮፌሰር)

   ስልክ፡ 0918771312፤ ኢሜል felekeam@yahoo.com
3. ዶ/ር በሪሁን መጋቢዉ (ኤምዲ፤ኤምፒኤች፤ተባባሪ ፕሮፌሰር)

   ኢሜል beredome@gmail.com፣ ማናገር ይችላሉ፡፡

Annex C: Consent form

UNIVERSITY OF GONDAR
COLLEGE OF MEDICINE AND HEALTH SCIENCES
INSTITUTE OF PUBLIC HEALTH

A questionnaire prepared to assess blood pressure control and factors associated with it among hypertensive patients in Debre Tabor Hospital, South Gondar Zone, Amhara National Regional State, Northwest Ethiopia.

Greeting

Dear participants!

I am_____recruited as a data collector for the research that will be conducted by university of Gondar student **DESTAW FETENE**, among hypertensive patients taking antihypertensive drugs at DTH. All eligible hypertensive patients in this hospital who are taking antihypertensive drug will be included in the study. And you are one of anti hypertensive drug users in this Hospital. So I kindly request you to participate in this study.

The purpose of this study is to generate information about magnitude of controlled BP and factors associated with it among hypertensive patients who are taking anti hypertensive drugs at DTH. The result of the study will help policy makers, responsible persons in the health institution, stakeholders and significant others to take actions.

There are questions related to your blood pressure for you to answer. Your name will not be included in the information and I promise to keep the confidentiality of your response. It is your full right to refuse in responding any question or all of the questions. If you decide that you do not want to participate; it will not affect the services you receive at the hospital.

However, your honest answers to these questions will help us in better understanding of magnitude of blood pressure control and associated factors, so; we are requesting you to give us your honest responses and keep participation. It will take a maximum of 30 minutes to answer these questions.

Would you willing to participate please?

I have been briefly informed about the study and I clearly understood the objective.

And agreed to take part in the study as an interviewee_____

But do not agreed to take part in the study as an interview_____

English version of the Questionnaire

General information

Serial no._____ Kebele_____
Data collection date_____
Name of data collector_____
Signature _____

Section I: Assessment of Socio-demographic and economic variables

S.No	Assessment of Socio-demographic and socio economic variables		
	Question	**Response**	**Remark**
101	Sex	1. Male 2. Female	
102	How old are you?	----------Years	
103	What is your ethnic group?	1. Amhara 2. Tigre 3. Agew 4. Others, specify----------	
104	What is your religion?	1. Orthodox 2. Muslim 3. Protestant 4. Others, specify----------	
105	What is your marital status?	1. Single 2. Married 3. Divorced 4. Widowed 5. Separated	
106	What is the highest level of education you have completed?	1. Unable to read and write 2. Read and write 3. Primary school 4. Secondary school 5. High school/preparatory school 6. College/University completed	
107	Occupational status?	1. Government employee 2. Retired 3. House wife 4. Daily laborer 5. Merchant 6. Farmer 7. No job 8. Others, specify _____	
108	Residence?	1. Urban 2. Rural	
109	Average Family monthly income?	_____ETB	

Section II: Behavioural Measurements

Tobacco Use			
S.No	**Question**	**Response**	**Remark**
201	Do you ever smoke cigarettes?	1. Yes 2. No	If no skip to question 205
202	For how long do you smoke cigarettes?	1. Below 1 year 2. 1-5 year 3. >5 year	
203	Do you smoke daily?	1. Yes 2. No	
204	How many cigarettes per day?	---------Number	
205	Do you consume an alcoholic drink during the last 6 months?	1. Yes 2. No	If not skip to Q209
206	What type of alcohol did you drink?	1. Beer 2. Wine 3. Tella/Local beer 4. Areki 5. Others, specify____	
207	On average how many glasses/bottles do you drink per day?	_____bottles/glasses/birlie/Tassa	
208	How frequent did you drink alcoholic drink per week?	---------days	
209	During the last 6 months, on most days of the week which type of diet did you eat?	1. Meat 2. Fruits 3. Vegetables 4. Cereal products 5. Other, specify____	
210	What type of oil or fat is most often used for meal preparation in your household during the last 6 months?	1. Vegetable oil 2. Butter 3. Sesame /nug oil 4. Others, specify__	
211	During the last 6 months do you used additional salt added on plate after food preparation?	1. Yes 2. No	
212	Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like [carrying or lifting heavy loads, digging or construction work] during the last 6 months?	1. Yes 2. No	**If no skip to Q 215**

213	In a typical week, on how many days do you do vigorous-intensity activities as part of your work?	_____days	
214	How much time do you spend doing vigorous-intensity activities at work on a typical day?	_____Hours/minutes	
215	Do you walk or use a bicycle (pedal cycle) to go to and from places in the last 6 months?	1. Yes 2. No	If No skip to Q 301
216	In a typical week, on how many days do you walk or bicycle to get to and from places?	_____ days	
217	How much time do you spend walking or bicycling for travel on a typical day?	_____Hours/minutes	

Section III: Co-morbidities

S.No	Question	Response	Remark
301	Is there cardiovascular disease?	1. Yes 2. No	From card records
302	Is there diabetes mellitus?	1. Yes 2. No	"
303	Is there chronic kidney diseases?	1. Yes 2. No	"
304	Is there asthma?	1. Yes 2. No	"
305	Do you have family history of hypertension?	1. Yes 2. No	By interviewing
306	Do you receive Health education/advice about your disease?	1. Yes 2. No	"

Section IV: Medication related

S.No	Question	Response		Remark
401	What types of drug you take during the last 6 months?	1. HCT 2. Enalapril 3. Nifidipine 4. Methyldopa 5. Propranolol 6. Atenolol 7. Others, specify		From card review
402	How many drugs do you take per day?	_____ __drugs		
403	Medication adherence	Yes	No	
403 A	Do you ever forget to take your antihypertensive drugs?	0	1	
403B	Do you ever have problems remembering to take your antihypertensive medications?	0	1	
403C	When you feel better, do you sometimes stopped taking your antihypertensive medicine?	0	1	
403D	Sometimes if you felt worse when you take your antihypertensive medicine, do you stopped taking it?	0	1	

Section V: Blood pressure measurements			
501	5 months before the study	Systolic _____mmHg Diastolic_____mmHg	From card review
502	2 months before the study reading	Systolic _____mmHg Diastolic_____mmHg	
503	Current reading	Systolic _____mmHg Diastolic_____mmHg	

Annex D: Consent form in Amharic version

በጎንደር ዩኒቨርሲቲ የህክምናና ጤና ሳይንስ ኮሌጅ የህብረተሰብ ጤና አጠባበቅ ኢንስቲትዩት

በአማራ ክልላዊ መንግስትጤና ጥበቃ ቢሮ፤ በደቡብ ጎንደር ዞንበደብረታቦር ሆስፒታል ለደም ግፊት በሽታ የመድሃኒት ክትትል የሚያደርጉ ታካሚዎች የህክምና ዉጤት እና ተዛማጅ ሁኔታዎችን የሚዳስስ ጥናት ::

የመጠይቅ ፈቃድ

የተከበራችሁ የጥናቱ ተሳታፊዎች

እኔ----------በደብረታቦር ሆስፒታል ለደም ግፊት በሽታ የመድሃኒት ክትትል የሚያደርጉ ታካሚዎችን የህክምና ዉጤት እና ተዛማጅ ሁኔታዎችን በተመለከተ ጥናት ለሚያጠኑት የጎንደር ዩኒቨርሲቲ ማስተርስ ተማሪ ለሆኑት **ተማሪ ደስታዉ ፈጠነ** ለመመረቂያ ጥናታዊ ጽሁፍ ይረዳቸዉ ዘንድ መረጃ ለማሰባሰብ ከተመረጡት መካከል አንዱ ነኝ። ሁሉም በዚህ ሆስፒታል የሚገኙና መስፈርቱን የሚያሟሉ የደም ግፊት መድሀኒት ተጠቃሚዎች በጥናቱ የሚካተቱ ይሆናሉ። እርሰዎም የመድሀኒቱ ተጠቃሚ እንደመሆንዎ መጠን በዚህ ጥናት እንዲሳተፉ በአክብሮት እንጠይቅዎታለን።

የዚህ ጥናት ዋና አላማ በደብረታቦር ሆስፒታል የደም ግፊት መድሀኒት ክትትል የሚያደርጉ በሽተኞች የህክምና ዉጤትና ተያያዥ ምክንያቶችን በተመለከተ መረጃ ለማግኘት ነው:: የዚህ ጥናት ዉጤት ለፖሊሲ አዘጋጅዎች፤ በጤና ተቋማት ውስጥ ለሚሰሩት ባለሙዎች፤ ኢጋዥ አካላት ችግሩ እንዳይባባስ ለመከላከል ከፍተኛ እገዛ ይኖረዋል

የደም ግፊት የህክምና ዉጤት እና ተያያዥ ምክንያቶችን በተመለከተ እረሰዎ ሊመልሰቸዉ የሚገባ ጥያቄዎች አሉ። በዚህ መጠይቅ ላይ ስምዎ አይጻፍም የማንኛውም ግለሰብ ሀሳቡ ሙሉ በሙሉ በሚስጥር የተጠበቀ ነው:: በመጠይቁ ያለመሳተፍ በሙሉም ሆነ በከፊል ጥያቄዎችን ያለመመለስ ሙሉ መብት አለዎት:: በጥናቱ ባለመሳተፍዎት ከሆስፒታሉ የሚያገኙት ማንኛዉም አገልግሎት ኤይቋረጥም። ነገር ግን የእርሰዎ ቅን የሆነ ምላሽ የደም ግፊት የህክምና ዉጤት እና ተያያዥ ምክንያቶችን ለመገንዘብ ይረዳናል።ስለዚህ ግልፅ የሆነ ምላሽንና ከልብ የመነጨ ተሳትፎዎን እንዲሰጡን በአክብሮት እንጠይቃለን:: መጠይቁን ለመሙላት ሊወስድ የሚችለው ጊዜ ቢበዛ 30 ደቂቃ ነው:: ለመሳተፍ ፈቃደኛ ነዎት?

በመረጃ ሰብሳቢዉ/ዋ አማካኝነት ስለጥናቱ የተደረገልኝን ገለፃ ተረድቻለሁ ምክንያቱንም በትክክል ገብቶኛል

በመሆኑ ለመሳተፍ ተስማምቻለሁ----------

ነገር ግን ለመሳተፍ አልተስማማሁም----------

አጠቃላይ መረጃ

01. መለያ ቁጥር---------- ቀበሌ ----------

02. መጠይቁ የተካሔደበት ቀን ----------/----------/----------

03. የመረጃ ሰብሳቢው ስም---------- ፊርማ ----------

ክፍል አንድ ማህበራዊና ስነ ህዝባዊ መረጃዎች

ተ.ቁ	ጥያቄዎች	ምላሽ	ምርመራ
101	ፃታ	1. ወንድ 2. ሴት	
102	እድሜዎ ስንት ነው?	----------ዓመት	
103	ብሔር?	1. አማራ 2. ትግሬ 3. አገዉ 4. ሌላ ይገለጽ----------	
104	ሐይማኖት?	1. ኦርቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ሌላ ይገለጽ----------	
105	የጋብቻ ሁኔታ?	1. ያላገባ/ች 2. ያገባ/ች 3. የፈታ/ች 4. የሞተችበት/ባት 5. ተለያይተው የሚኖሩ	
106	የትምህርት ደረጃ?	1. ማንበብና መፃፍ የማይችል/የማትችል 2. ማንበብና መፃፍ የሚችል/የምትችል 3. የመጀመሪያ ት/ት (1-8) 4. 2ኛ ደረጃ ትምህርት (9-10) 5. መሰናዶ ትምህርት (11-12) 6. ኮሌጅ/ዩኒቨርሲቲ ያጠናቀቀ	
107	የስራ ሁኔታ?	1. የመንግስት ሰራተኛ 6. ገበሬ 2. ጡረተኛ 7. ስራ የሌለው 3. የቤት እመቤት 8. ሌላ ይገለጽ----- 4. የቀን ሰራተኛ 5. ነጋዴ	
108	የመኖሪያ አድራሻ?	1. ከተማ 2. ገጠር	
109	አማካይ ወርሃዊ የቤተሰብ ገቢ?	----------የኢትዮጵያ ብር	

ክፍል ሁለት፡- ከስነ ባህሪ ጋር የተያየዙ ጥያቄዎች			
ተ.ቁ	ጥያቄዎች	ምላሽ	**ምርመራ**
201	ሲጋራ አጭሰዉ ያዉቃሉ?	1. አዎ 2. የለም	የለም ካሉ ወደ ጥያቄ 205 ይለፉ
202	ለምን ያክል ጊዜ አጭሰዉ ያዉቃሉ?	1. ከ 1 አመት በታች 2. ከ 1-5 አመት 3. ከ 5 አመት በላይ	
203	በየቀኑ ያጨሻሉ?	1. አዎ 2. የለም	
204	በቀን ምን ያክል ሲጋራ ያጨሻሉ?	---------በቁጥር	
205	በዚህ 6 ወር ዉስጥ የአልኮል መጠጦችን ጠጥተዉ ያዉቃሉ?	1. አዎን 2. የለም	መልሱ የለም ከሆነ ወደ ጥያቄ 209 ይለፉ
206	ምን አይነት የአልኮል መጠጦችን ተጠቅመዉ ያዉቃሉ?	1. ቢራ 3. ጠላ 2. ወይን 4. አረቂ 5.ሌላ ይገለጽ-------	
207	በቀን ዉስጥ ምን ያክል የአልኮል መጠጥ ተጠቅመዉ ያዉቃሉ?	---------- ጠርሙስ/ብርጭቆ/ብርሌ/ጣሳ ባለ---------ሚሊ ሊትር	
208	በሳምንት ዉስጥ ስንት ቀን ይጠጣሉ?	----- ቀን	
209	አዘዉትረዉ የሚመገቡት ምግብ ምንድን ነዉ?	1. ስጋ 2. ፍራፍሬ 3. ቅጠላቅጠል 4. የእህል ዉጤቶች 5. ሌላ ይገለጽ----------	ከ 1 በላይ መመለስ ይቻላል
210	አብዛኛውን ጊዜ ለምግብ ዝግጅት ምን አይነት ዘይት ወይም ቅባት ተጠቅመዉ ያዉቃሉ?	1. የሚረጋ ዘይት 2. ቅቤ 3. የሲሊጥ /የኑግ ዘይት 4. ሌላ ይገለጽ----------	
211	በዚህ 6 ወር ዉስጥ ጨዉ ያለበት ምግብ ተጠቅመዉ ያዉቃሉ?	1. አወ 2. የለም	
212	በዚህ 6 ወር ዉስጥ የሚሰሩት ስራ ብዙ ጉልበትና ሀይል የሚጠይቅ የልብ ምትንና የአተነፋፈስን ፍጥነት የሚጨምር ነውን? ማለትም መሸከም፣ መቆፈር፣ወይም ግንባታን ወዘተ	1. አዎ 2. የለም	መልሱ የለም ከሆነ ወደ ጥያቄ 215 ይለፉ
213	በሳምንት ውስጥ ምን ያህል ቀናት ጉልበትና ኃይል የሚጠይቅ ስራ ይሰራሉ?	_____ቀናት	
214	በቀን ውስጥ ምን ያህል ደቂቃ/ሰዓት ከባድ ጉልበትና ሃይል የሚጠይቅ ስራ እየሰሩ ያሳልፋሉ?	------- በሰዓት/በደቂቃ	
215	ባለፈዉ 6 ወር ዉስጥ ወደ ተለያዩ ስፍራዎች ለመድረስ/ለመንቀሳቀስ በእግር ጉዞ አድርገዉ ያዉቃሉ?	1. አዎ 2. የለም	
216	በሳምንት ውስጥ ምን ያህል ቀናት ወደ ተለያዩ ስፍራዎች ለመድረስ ወይንም ለመንቀሳቀስ በእግር ጉዞ አድርገዉ ያዉቃሉ?	--------ቀናት	
217	በቀን ውስጥ ምን ያህል ሰዓት/ደቂቃ በእርምጃ ከቦታ ቦታ በመዘዋወር የሳልፋሉ	----በሰዓት/በደቂቃ	

ክፍል፡-ሶስት ተዛማጅ በሽታዎችን በተመለከተ			
ተ.ቁ	ጥያቄ	መልስ	ምርመራ
301	የልብ ድካም በሽታ	1. አለ 2. የለም	ከካርድ የሚወሰድ
302	የስኳር በሽታ	1. አለ 2. የለም	ከካርድ የሚወሰድ
303	የቆየ የኩላላት በሽታ	1. አለ 2. የለም	ከካርድ የሚወሰድ
304	የአስም በሽታ	1. አለ 2. የለም	ከካርድ የሚወሰድ
305	በወላጆችዎመካከል የደም ግፊት መጨመር ያለበት ሰው አለ?	1. አዎ 2. የለም	በመጠየቅ
306	ስለበሽታዎ የጤና ትምህርት ተነግሮዎት ያውቃል?	1. አዎ 2. የለም	በመጠየቅ

ክፍል አራት፡- መድሃኒትን በተመለከተ		ምላሽ		
401	በዚህ 6 ወር ዉስጥ የወሰዱት የደም ገፊት መድሃኒት አይነት	1. HCT 2. Enalapril 3. Nifidipine 4. Methyldopa 5. Propranolol 6. Atenelol 7. ሌላ ይገለጽ-------		ከካርድ በማት
402	ላለፉት 6 ወራት በቀን በቀን ምህ ያክል መድሃኒት ወስደዉ ያዉቃሉ?	------- -----በቁጥር		
403	የደም ገፊት መድሀኒትን በአግባቡ እና በተገቢዉ ሰአት መዉሰድን በተመለከተ	አዎ	የለም	
403ሀ	የደም ገፊት መድሀኒትዎን ረስተዉ ያዉቃሉ?	0	1	
403ለ	የደም ገፊት መድሀኒትዎን እንዳይወስዱ የከለከለዎት የሚያስታዉሱት የገጠመዎት ችግር አለ?	0	1	
403መ	አንዳንዴ ሻል ባለዎት ጊዜ የደም ግፊት መድሀኒትዎን አቁመዉት ያዉቃሉ?	0	1	
403ሰ	አንዳንዴ ህመሙ ባስ ባለብዎት ጊዜ መድሀኒቱን አቁመዉት ያዉቃሉ?	0	1	
ክፍል 5: Blood pressure measurements				
501	5 months before the study	Systolic _____ mmHg Diastolic_____ mmHg		ከካርድ በማየት
502	2 months before the study reading	Systolic _____mmHg Diastolic_____mmHg		
503	Current reading	Systolic _____ mmHg Diastolic_____mmHg		

Annex E: Declaration sheet

I, the undersigned, senior MPH student declare that this Research work is my original work in partial fulfillment of the requirement for the degree of Master of Public Health in Epidemiology and Biostatistics.

Name_____

Signature_____

Place of submission: Institute of Public Health, College of Medicine and Health Sciences, University of Gondar.

Date of submission: _____

This research work has been submitted with my/our approval as university advisor(s)

Advisors

Name	Signature
1. _____	_____
2. _____	_____

UNIVERSITY OF GONDAR

COLLEGE OF MEDICINE AND HEALTH SCIENCES

INSTITUTE OF PUBLIC HEALTH

Approval sheet

This is to certify that the thesis entitled “Blood pressure control and its associated factors among hypertensive patients attending in Debretabor Hospital, Amhara National Regional State, Northwest Ethiopia, 2015” submitted by **Destaw Fetene** for the award of MPH degree in Epidemiology and Biostatistics was carried out under our supervision and the thesis has not been previously submitted in part or full for any degree or diploma for this or any university.

Advisors:

1. Mr. Amsalu Feleke (MPH, Associate Professor) _____
2. Dr. Berihun Megabiaw (MD, MPH, PhD Candidate, Associate Professor)____